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RECORDS OF LARGE FRESH-WATER MUSSELS

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CURATOR OF LOWER INVERTEBRATES

While collecting information on maximum sizes in bivalves for the chapter "Ecology" in my forthcoming monograph on the bivalves in Bronn, I have been puzzled by the fact that the literature contains comparatively few statements on the subject, and these scattered over a wide field. It occurred to me, therefore, that a compilation of data would not be unwelcome. A difficulty arose in the very beginning in that it is not always possible to tell if the dimensions given as maximum ones for certain species really are such, since there is no exact character by which the point can be determined at which a bivalve shell is fully grown. In fact, we do not know if there is such a thing as "fully grown," since growth apparently continues throughout the life of the animal. Because of this I have not assumed that certain outstanding sizes can really be called maximum ones, but have been satisfied to list them as over average, or remarkably large specimens, or even only larger ones than those previously recorded.

The list includes only naiads or pearly fresh-water mussels, since my long occupation with this group has given me a more extensive knowledge of their sizes. Even then, of course, the list is not even approximately complete. I have omitted, with a few exceptions, information contained in any of the many monographs on the subject of naiads (e.g., Clessin, 1874; Haas, 1910b; Küster, 1854; Lea, 1834-74; Zwiesele, 1913a-d; and all of the monographs of Sowerby in the *Conchologia Iconica*) as well as local monographs, especially the classical one of F. C. Baker, 1928, in all of which additional information on the subject can be easily obtained.

I did collect and used in the following list, statements scattered in periodicals of every kind as well as unpublished notes on the many specimens which in the course of years have been sent me by museums and private collectors for classification and study. Being

fully aware of the incompleteness of the information thus given, I should highly appreciate any supplementary data with which my readers will be so good as to supply me.

From a taxonomic viewpoint it may not be without interest to learn from my list that in some cases younger and older shells have been previously placed in different genera, one of which became a synonym of the other when the discovery of transitional stages between the two extremes clearly showed the generic relationship. In other cases specimens of old shells have been described under a different specific name than young shells of the same animal; here, too, additional material helped to clarify the nomenclatorial status. The confusion in these cases is due to the fact that both outline and hinge of the naiads change considerably during individual growth, rendering the adult shell, under certain circumstances, apparently quite different from the young one.

The nomenclature followed in this list is, for the North American species, that of Frierson's *Classified and Annotated Check List of the North American Naiads*, 1927, and for the Palearctic species, my own tentative classification of Palearctic Unionids, published in 1940.

All measurements are in millimeters.

NORTH AMERICAN SPECIES

Anodonta grandis Say

Length 203.2. Spoon River, Illinois; Strode, 1896, p. 116.

Lasmigona costata Rafinesque

Length 157, height 90, diameter 52. Locality unknown; Field Museum No. 16306.

Length 177.8. Spoon River, Illinois; Strode, 1896, p. 116.

Lasmigona complanata Barnes

Length 216. Spoon River, Illinois; Strode, 1896, p. 116.

Tritogonia verrucosa Rafinesque

Length 190.5. Spoon River, Illinois; Strode, 1896, p. 116.

Amblema plicata plicata Say

Length 171.4. Spoon River, Illinois; Strode, 1896, p. 116.

There is some uncertainty whether the species to which Strode refers under the denomination of *Unio plicatus* Les., is what now is called *Amblema plicata plicata* or *Amblema dombeyana*. There is no *Unio plicatus* Les., as Strode writes, but a *U. plicatus* Lea, which is

a synonym for *Amblema dombeyana*. But since there are no specimens of that species from Spoon River in the Strode *Unio* collection, now in Field Museum, but several specimens of *Amblema plicata plicata* Say, there is more probability that Strode had the latter one before him when he wrote his note.

Amblema gigantea Barnes

Length 209, height 146. East Fork, White River, Indiana; Chamberlain, 1933, p. 29.

Length 216, height? Spoon River, Illinois; Strode, 1896, p. 116.

Length 216, height 150. Eagle Creek, Carroll County, Kentucky; Marshall, 1922, p. 25, U. S. Nat. Mus. No. 346631.

Length 218, height 138. Ohio River, Illinois; Chamberlain, 1933, p. 29.

Length 279, height? diameter? weight 1,816 kg. Spoon River, Illinois(?); F. C. Baker, 1928, p. 72.

Length 280, height 203. Salt River, Kentucky; Coker, 1919, p. 26.

There is an anonymous (1932) mention of a specimen of this species from the Ohio River, whose dimensions are not given, but whose age is estimated from the so-called growth rings to be 53 years. Aside from the age estimation which might have been somewhat exaggerated, the specimen in question must have been of rather outstanding dimensions.

Lampsilis recta Lamarek

Length 177.8. Spoon River, Illinois; Strode, 1896, p. 116.

Lampsilis teres Rafinesque

Length 177.8. Spoon River, Illinois; Strode, 1896, p. 115.

Lampsilis carinata Barnes

Length 266.7. Spoon River, Illinois; Strode, 1896, p. 115.

Lampsilis fragilis Rafinesque

Length 177.8. Spoon River, Illinois; Strode, 1896, p. 116.

Proptera capax Green

Length 142, height 108, diameter 88. Bone Bank, Wabash River, Indiana; Field Museum No. 11077.

Glebulula suborbiculata Lamarek

Length 131, height 93, diameter 63. Green Lake, Calhoun County, Texas; Field Museum No. 15041.

Length 133.3. Arch Bayou, Texas; Strode, 1896, p. 116.

SOUTH AMERICAN SPECIES

Diplodon asuncionis Marshall

Length 87, height 52, diameter 20. Paraguayan Chaco; Amsterdam Museum.

AUSTRALIAN SPECIES

Hyridella shuttleworthii Lea

Length 133, height 70, diameter 45. Macquarie River, Australia; Senckenberg Museum, Frankfurt-on-Main.

AFRICAN SPECIES

Caelatura horei E. A. Smith

Length 72, height 48, diameter 34. Lake Tanganyika; Bourguignat, 1886, p. 8, as *Unio jouberti* sp. nov.

Aspatharia petersi Martens

Length 171. Krüger Park, Union of South Africa; Haas, 1936, p. 97.

ASIATIC SPECIES

Anodonta woodiana lauta Martens

Length 240, height 140, diameter 75. Japan; Haas, 1930, p. 11.

Cristaria discoidea discoidea Lea

Length 99, height 59, diameter 39. Tonkin; Haas, 1910a, p. 499, described as *Cristaria inangulata* sp. nov.

Cristaria plicata herculea Middendorff

Length 285, height 172, diameter 85. Peking; Deshayes, 1874, p. 6, pl. 1, fig. 1.

Length 300, height 181, diameter 95. River Onon, southeast Siberia; Middendorff, 1847, p. 304.

According to a statement by Kobelt (1879, p. 145), Middendorff had specimens of his *Anodonta herculea* measuring as much as 400 mm. This statement, which made the species in question by far the largest of all naiads and which has been frequently quoted in the literature, unfortunately can not stand close inspection. Middendorff (1847, p. 304) does speak of a specimen of *A. herculea* 0.41 long, but the unit connected with this numeric statement is not the meter, but the decimeter, as stated by him above; thus, the measurement under consideration is not 410 mm., as erroneously supposed by Kobelt, but only 41 mm., which is in conformity with statements in the text referring to the specimen in question as very young, but already typical.

Cristaria plicata spatiosa Clessin

Length 240, height 120, diameter 70. Japan; Simpson, 1914, p. 229.

Length 258, height 143, diameter 70. Lake Biwa, Japan. Field Museum No. 2583.

Length 274, height? diameter? Japan; Kobelt, 1879, p. 145.

Lanceolaria grayana Lea

Length 170, height 44, diameter 39. Tonkin; Haas, 1910b, p. 46, pl. 2, fig. 1.

Lanceolaria cylindrica Simpson

Length 167, height 36, diameter 32. Ussuri River, eastern Siberia; Haas, 1910b, p. 60.

Length 171, height 35, diameter 32. Ussuri River, eastern Siberia; Haas, 1910b, p. 60, pl. 5, figs. 1-2.

Simpson (1900), the author of this species, gave some incorrect measurements and some erroneous information about it, both of which have been straightened out (Haas, 1910b, p. 60). As to the special new section of *Lanceolaria* founded by Simpson for his *cylindrica*, I am, after having studied part of the original material collected by Schrenck, on which Simpson's *cylindrica* is based, rather doubtful about its validity and have ventured the suggestion that both the new section, *Cylindrica*, and the new species, *cylindrica*, described by Simpson are female specimens of *Lanceolaria grayana* Lea, maybe of a northern subspecies of it; but all this is still open to argument.

Lanceolaria oxyrhyncha Martens

Length 100, height? diameter? Japan; Ihering, 1893, p. 156.

Orynaia pugio Benson

Length 100, height 38, diameter 35. India; Haas, 1923, p. 196; type of *Unio digitiformis* Sowerby.

Acuticosta chinensis Lea

Length 66, height 43, diameter 31. Niho River, Shantung, China; Haas, 1914, p. 241, pl. 30, fig. 1.

Schistodesmus lampreyanus Baird and Adams

Length 57, height 37, diameter 28. China; Simpson, 1914, p. 940.

Contradens ascia dimotus Lea

Length 84, height 57, diameter 38.5. Pajacombo, Sumatra; Haas, 1914, p. 203, pl. 22, fig. 5. Made the type of an invalid new genus, *Schizocleithrum*.

Parreysia favidens Benson

Length 77, height 55, diameter 40. Bengal; Berlin Museum.

Indonania substriata Lea

Length 70, height 39.5, diameter 28. Bangkok, Thailand; collection of Dr. E. Paravicini, Basel, Switzerland.

Lamprotula nodulosa Wood

Length 138, height 90, diameter 90. Rivière Claire, Tonkin; Rolle, 1904, p. 25, pl. 3, pl. 4, fig. a; described as *Unio* (*Quadrula*) *liedkei* sp. nov.

Caudiculatus caudiculatus Martens

Length 84, height 60, diameter 32.5. Soengei Sangei River, Borneo; Haas, 1927, p. 21.

Length 87, height 63, diameter 32.5. Soengei Sangei River, Borneo; Haas, 1927, p. 21.

Hyriopsis cumingii Lea

Length 264, height 189, diameter 69. Tonkin; Rolle, 1904, p. 25, pls. 1, 2; described as *Hyriopsis goliath* sp. nov.

Chamberlainia hainesiana Lea

Length 237, height 152, diameter 92. Mekong; Rochebrune, 1882, p. 27, pl. 1, fig. 2; described as *Unio duclerci* sp. nov.

Length 261, height 170, diameter 83. Rivière Claire, Tonkin; Rochebrune, 1904, p. 465; described as *Simpsonia demangei* gen. et sp. nov.

PALEARCTIC SPECIES

Margaritifera auricularia auricularia Spengler

Length 153, height 72, diameter 41. Adour River, southwestern France; Rossmassler, 1854, pl. 70, fig. 853.

Length 150–180, height 60–90, diameter 30–48. Locard, 1893, p. 152.

Margaritifera margaritifera dahurica Middendorff

Length 177, height 69, diameter 40. Amur River, eastern Siberia; Shadin, 1938, p. 111.

Psilunio littoralis littoralis Lamarck

Length 60–80, height 40–48, diameter 20–28. France; Locard, 1893, p. 152.

Length 91, height 54, diameter 23. Abbeville, northeastern France; Rossmassler, 1836, pl. 13, fig. 195, as *Unio sinuatus* (= *Margaritifera a. auricularia* in modern nomenclature), but

obviously *Psilunio l. littoralis* as corroborated by the locality given, which is out of the range of the actual distribution of *M. a. auricularia*, but within that of *P. l. littoralis*.

Psilunio littoralis umbonatus Rossmmaessler

Length 92, height 64, diameter 31. Guadalquivir River at Seville, Spain; Bourguignat, 1865, p. 339, pls. 17–18.

Pseudodontopsis euphraticus Bourguignat

Length 120, height 80, diameter 40. Euphrates River, Iraq; Bourguignat, 1856, p. 71, pl. 8, fig. 6, pl. 9, fig. 1.

Anodonta cygnea Linnaeus

Length 177.8, height? diameter? Sutton-in-Ashfield, Notts., England; Musson, 1884, p. 112.

Length 193.6, height? diameter? Sutton-in-Ashfield, Notts., England; Musson, 1884, p. 112.

Length 200, height 95, diameter 80. Platschütz, near Altenburg, Thuringia, Germany; Rossmmaessler, 1854, pl. 89, fig. 968; described as var. *cordata*.

Length 210, height 118, diameter? Germany, no exact locality; Rossmmaessler, 1837, pl. 25, fig. 342.

Length 222, height 96, diameter 82. Hummelshayn, Thuringia, Germany; Israel, 1913, as *A. cellensis* Gmelin.

Length 260, height 130, diameter 100. Siematycze, Bielsk County, Poland; Feliksiak, 1930, p. 135, pl. 4.

Anodonta vescoiana Bourguignat

Length 135, height 84, diameter 63. Nahr Bahlik, tributary of Euphrates; Pallary, 1933, p. 150; 1939, p. 121, pl. 7, fig. 1.

Length 140, height? diameter? Nahr Bahlik, tributary of Euphrates; Pallary, 1933, p. 150.

Described as *Anodonta* (*Euphrata* sect. n.) *bahlikiana* Pallary; the figure recently given by Pallary makes it impossible to see anything else in *A. (Euphrata) bahlikiana* than a typical *Anodonta vescoiana* Bourguignat.

Pseudanodonta middendorffi middendorffi Siemaschko

Length 98, height 50, diameter 22. Ahtanisov-Liman, southern USSR; Kobelt, 1911, p. 53, pl. 476, fig. 2549; described as *Pseudanodonta complanata euxina* Kobelt.

Pseudanodonta middendorffi compacta Zelebor

Length 98, height 50, diameter 23. Moravia; Kobelt, 1911, p. 51, pl. 475, figs. 2545–46.

Unio crassus crassus Retzius

Length 95, height 48, diameter 37. Livonia, Baltic USSR; Riemschneider, 1907, p. 42, fig.; as *Unio pseudolittoralis* Clessin.

Length 100, height 54, diameter 42. River Tapsaue, Schleswig; Kobelt, 1872, p. 142, pl. 5; described as *Unio crassus* var. *maximus* var. nov.

Length 85–110, height 42–45, diameter 32–36. Central Sweden; Westerlund, 1890, p. 66, as *Unio ater* var. *elegans* Westerlund.

Unio crassus gontieri Bourguignat

Length 110, height 52, diameter 44. River Irenj, Perm, USSR; Kobelt, 1912, p. 24, pl. 490, figs. 2622–23; described as *Unio kungurensis* sp. nov.

Unio crassus cytherea Küster

Length 86, height 41, diameter? St. Leonhard near Maribor, Carniolia, Yugoslavia; Rossmäessler, 1838, pl. 35, fig. 491; as *Unio consentaneus legitimus* Rossmäessler.

Length 86, height 40, diameter? Creek Sechta at Unterschneidheim, Württemberg, Germany; Haas and Schwarz, 1913, pl. 2, fig. 7.

Length 90, height 44, diameter 31. Sajóudvarhely, Hungary; Czogler and Rotarides, 1936, p. 151.

Unio pictorum pictorum Linnaeus

Length 117.5, height 55, diameter? Fleckney, Leicestershire, England; Taylor, 1884, p. 224.

Length 118, height 46, diameter? Pond of St. Gotthard, Merseburg, Germany; Rossmäessler, 1837, pl. 29, fig. 409.

Length 119.4, height 54.6, diameter? Wiston, England; Norman, 1857, p. 5759.

Length 120, height? diameter? Skernesö, Falster, Denmark; Schlesch, 1933, p. 131.

Length 124, height 55, diameter? Ossington Lake, Notts., England; Taylor, 1884, p. 224.

Length 130.9, height? diameter? River Weise near Namslau, Silesia, Germany; C. Boettger, 1935, p. 141. Partly regarded as hybrids between *Unio pictorum* and *U. tumidus*.

Length 131.7, height? diameter? Ossington Lake, Notts., England; Gain, 1884, p. 112.

Unio pictorum latirostris Küster

Length 100, height 34, diameter 32. Ponds of River Tisza, Hungary; Czogler and Rotarides, 1936, p. 152.

Length 105, height 38, diameter 32. Ponds of River Tisza, Hungary; Czogler and Rotarides, 1936, p. 152.

Unio pictorum platyrhynchus Rossmmaessler

Length 125, height 48, diameter? St. Leonhard near Maribor, Carniola, Yugoslavia; Rossmmaessler, 1844, pl. 59, fig. 767; described as *Unio pictorum* var. *ponderosus* Spitzl.

Length 128, height? diameter? Same locality and, too, as var. *ponderosus*; Küster, 1854, p. 87, pl. 23, fig. 3.

Unio pictorum schrenckianus Clessin

Length 137, height? diameter? USSR; Shadin, 1938, p. 77, as *U. pictorum* var. *ponderosus* Spitzl.

Unio tumidus tumidus Retzius

Length 109.2, height 65.6, diameter? Fleckney, England; Norman, 1857, p. 5758.

Length 120, height 60, diameter 54. Berzence, Hungary; Czogler and Rotarides, 1936, p. 147.

Length 120.6, height 66.6, diameter? Regston, Derbyshire, England; Fowler, 1877, p. 67.

Length 123, height 61, diameter 48. Berzence, Hungary; Czogler and Rotarides, 1936, p. 147.

Length 125, height 65, diameter? River Werra, Germany; Israel, 1913.

Unio tumidus borysthenensis Kobelt

Length 104, height 50, diameter 41. Rivers Ik and Oka, USSR; Shadin, 1938, p. 81, fig. 19; described as *Unio tumidus* var. *bashkiricus* var. nov.

Unio pictorum platyrhynchoideus Dupuy

Length 112–136, height 35–65, diameter 38–40. France; Locard, 1893, p. 199, as *Unio danielis* Gassies.

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